

# ARTICLE OF FOOTWEAR HAVING A FLEXIBLE INSOLE

## TITLE OF THE INVENTION

**[0001]** Article of Footwear Having a Flexible Insole

## BACKGROUND OF THE INVENTION

### FIELD OF THE INVENTION

**[0002]** An article of footwear includes a flexible horizontal insole member formed by molding from a synthetic plastic material, the bottom surface of said insole member containing adjacent the ball of the user's foot a plurality of transversely-extending flex grooves that define therebetween a plurality of generally-parallel transversely-extending longitudinally-spaced flex ribs that impart flexibility to the ball portion of the insole relative to the user's foot. The bottom surface of the insole also contains adjacent the arch portion of the user's foot a longitudinally extending shank slot for receiving a rigid or semi-rigid bowed shank member.

## DESCRIPTION OF THE RELATED ART

**[0003]** It is well known in the patented prior art to provide articles of footwear that make use of the well known Goodyear welt concept for securing together the upper and midsole components of the article of footwear, as shown, for example by the prior patents to Clements No. 6,601,319 (which is assigned to the owner of the instant application), and Bianchini, et al., No. 4,852,275, among others. In order to increase the flexibility of such footwear and to reduce the weight and cost thereof, various proposals have been set forth in the footwear industry.

**[0004]** The present invention was developed to provide an improved flexible, light-weight insole member that combines the multiple aspects of product design to reduce labor and material costs and production time throughout the Goodyear welt manufacturing process. Utilization of the flexible insole affords to the wearer a more stable and lighter article of footwear, while allowing the manufacturing process to

proceed smoother and faster, and while cutting down on inventory needs, as for example, pry-ribs, glue for the ply-ribs, cork or other bottom filler.

#### BRIEF SUMMARY OF THE INVENTION

**[0005]** Accordingly, a primary object of the present invention is to provide a flexible insole component for an article of footwear, wherein the insole is formed by molding a flexible synthetic plastic material to form a light-weight component containing in its bottom surface beneath the ball portion of the user's foot a plurality of transverse grooves, thereby to define therebetween a plurality of integral transversely-extending longitudinally-spaced flex ribs that impart flexibility to the insole.

**[0006]** According to another object of the invention, the bottom surface of the insole contains beneath the arch portion of the user's foot a longitudinally-extending shank slot that receives a rigid or semi-rigid shank member, thereby to impart stability to and support for the arch portion of the user's foot.

**[0007]** Another object of the invention is to provide an insole of the type described above that is caused to be moisture-resistant by the provision of an annular compressible gasket member in a sealing channel arranged concentrically about the area containing the flex grooves and the shank slot, thereby to isolate the same against ambient moisture.

**[0008]** The light-weight flexible insole component of the present invention permits the manufacture of the article of footwear to flow in a smoother, faster manner, and cuts down on inventory needs, such as ply-rib, glue for a ply-rib, cork, or other type of bottom filler.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0009]** Other objects and advantages of the invention will become apparent from a study of the following specification when viewed in the light of the accompanying drawings, in which:

**[0010]** Fig. 1 is a perspective view of a boot that includes the present invention;

**[0011]** Fig. 2 is an exploded perspective view of the boot of Fig. 1;

**[0012]** Figs. 3 and 4 are top and bottom views, respectively, of the insole of Fig. 2;

[0013] Figs. 5 and 6 are sectional views taken along lines 5-5 and 6-6, respectively, of Fig. 4;

[0014] Fig. 7 is a top plan view of the gasket seal member of Fig. 2, and Fig. 8 is a sectional view taken along line 8-8 of Fig. 7;

[0015] Figs. 9 and 10 are sectional views taken along lines 9-9 and 10-10, respectively, of Fig. 1; and

[0016] Fig. 11 is a sectional view taken along line 11-11 of Fig. 10.

#### DETAILED DESCRIPTION OF THE INVENTION

[0017] Referring first more particularly to Figs. 1 and 2, the article of footwear 2, which in the illustrated embodiment is in the form of a boot, includes an upper member 4 that is open at the bottom and that conforms with the upper portion of a user's foot, an insole member 6 that is arranged within the open bottom edge portion 4a of the upper member 4, and an annular Goodyear welt 8 that is secured to the insole 6 and the upper body member 4 by inseam stitching 10 (Figs. 9 and 10). The Goodyear welt is also secured by outseam stitching means 12 to the midsole member 14 to which is glued or stitched to the bottom or outsole member 16 having a forward toe portion 16a and a rearward heel portion 16b.

[0018] As shown in Figs. 3 and 4, the insole member 6 has a toe portion 6a, a ball portion 6b, an arch portion 6c, and a heel portion 6d, respectively, positioned beneath the corresponding portions of the user's foot. Preferably, the flexible insole member 6 is formed by molding from polyurethane or other synthetic plastic material, such as polyvinyl chloride, polyurethane, or the like. As shown in Fig. 4, in accordance with the present invention, the bottom surface of the insole member 6 contains adjacent the ball portion 6b thereof a plurality of parallel, transversely-extending flex grooves 20 that define therebetween a plurality of parallel integral flex bars 22. These flex grooves and bars afford flexibility to the ball portion 2b of the insole member. Furthermore, beneath the arch portion 6c, the insole member 6 contains a longitudinally-extending shank slot 24 in which is mounted a bowed semi-rigid shank member 26, thereby to support the arch

portion of the user's foot. The shank member 26 is preferably formed of fiberglass or similar hard synthetic plastic material, or of a metal such as steel. As shown in Fig. 11, the shank member 26 has a longitudinally bowed configuration, with the concave surface thereof facing downwardly.

**[0019]** According to another feature of the invention, the insole member 6 contains adjacent and spaced from the peripheral side wall thereof a continuous sealing channel 28 (Figs. 5 and 6) that receives an annular flexible sealing gasket 30 of Fig. 7. The sealing gasket 30 is formed from a water-resistant cushioning material, such as polyurethane, polyvinyl chloride, cork, or the like. As shown in Fig. 7, the configuration of the sealing gasket 30 corresponds generally with that of the sealing groove 28. Preferably, the thickness "t" of the gasket 30 is slightly greater than the depth of the sealing groove 28, thereby to effect compression of the gasket member and sealing between the adjacent surfaces of the midsole member and the insole member, as will be explained below. Also, the side walls 30a of the gasket are inwardly inclined relative to the horizontal bottom and vertical side walls of the sealing channel, thereby to facilitate insertion of the gasket member 30 within the sealing channel.

**[0020]** The upper portion of the peripheral side wall of the insole member 6 is provided with a continuous outwardly-extending horizontal lip portion 6e. As best shown in Figs. 9 and 10, the cross-sectional configuration of the welt member 8 is such as to force the lower edge portion 4a of the upper member 4 in reversely bent relation below the horizontal outwardly-projecting peripheral lip portion 6e of the insole member, thereby to firmly connect together the components at this important seam location. The upper member 4 is preferably formed from leather or a suitable flexible synthetic plastic material, and may be partially lined by the layer 5 as shown in Fig 10. It is initially formed around a foot form or shoe last and is attached to the insole member by gluing, stapling or wiring. Minor trimming operations are performed as the components are added to the upper member.

**[0021]** The midsole member 14 is formed of a suitable synthetic plastic cushioning material, and the bottom outsole member 16 is formed from a suitable durable synthetic

plastic material, or laminate thereof. In addition to the mid-stitching 12, the midsole can be glued or adhesively fastened to the lower surface of the insole, thereby compressing the sealing gasket 30. The outsole is normally glued or stitched to the midsole.

[0022] It should be mentioned that the use of the sealing gasket 30 – which serves as a water resistant material preventing moisture from entering the grooves 20 and the sealing channel 24 -- is optional. Thus, footwear that does not need to be moisture resistant will not require the sealing gasket.

[0023] The flexible insole of the present invention is suitable for use in both men's and women's shoes and boots. The invention is not limited to dress, casual, work, service or military footwear. The insole is lightweight, and requires lower inventories of materials -- i.e., eliminates the need for ply-ribs, glue, bottom fillers. It also results in lower production times, lower cost and quicker turn-around times. By integrally molding the flex ribs, bottom filler and shank slot into the insole, accurate positioning of the shank member is assured while affording greater flexibility to the insole.

[0024] While in accordance with the provisions of the Patent Statutes the preferred forms and embodiments of the invention have been illustrated and described, it will be apparent to those skilled in the art that various changes may be made without deviating from the inventive concepts set forth above.